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1309471

# THE UNITED STATES OF AMERICA

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*April 18, 2005*

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APPLICATION NUMBER: 60/557,103

FILING DATE: *March 26, 2004*

RELATED PCT APPLICATION NUMBER: *PCT/US05/09852*



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21861 U.S. PTO  
032604

## PROVISIONAL APPLICATION COVER SHEET

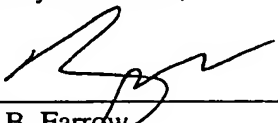
This is a request for filing a PROVISIONAL APPLICATION under 37 C.F.R. 1.53 (b)(2).

Docket Number		1373US		Type a plus sign (+) inside this box →	X
INVENTOR(s)/APPLICANT(s)					
Last Name	First Name	MI	Residence (City and either State or Foreign Country)		
Bloom	Michael	E.	Oak Grove, Minnesota		
Daley	Thomas	P.	Golden Valley, Minnesota		
Brezny	Tera	D.	Lino Lakes, Minnesota		
TITLE OF THE INVENTION					
Air Spray Gun Improvements in Nozzle and Aircap					
CORRESPONDENCE ADDRESS					
Graco Minnesota Inc. P. O. Box 1441 Minneapolis					
STATE	Minnesota	ZIPCODE	55440-1441	COUNTRY	U.S.A.
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/>	Specification	Number of Pages	5	<input type="checkbox"/>	Small Entity Statement
<input checked="" type="checkbox"/>	Drawing(s)	Number of Sheets	4	<input type="checkbox"/>	Other (specify)
METHOD OF PAYMENT (check one)					
<input type="checkbox"/>	A check or money order is enclosed to cover the Provisional filing fees			Provisional Filing Fee Amount (\$)	\$160.00
<input checked="" type="checkbox"/>	The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number: 07-1775				

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

- ☒ No.  
☐ Yes, the name of the U. S. Government agency and the Government contract number are:

Respectfully submitted,

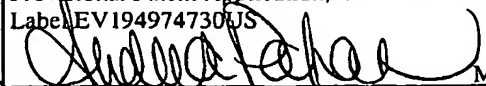
  
 Douglas B. Farrow

Date: March 26, 2004  
 Reg. No.: 28582

- ☐ Additional inventors are being named on separately numbered sheets attached hereto.

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 Andrea Pahan  
 Date: March 26, 2004

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- PTO/SB/17 (01-03)

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# **Fee Transmittal for FY 2003**

Effective 01/01/2003. Patent Fees are subject to annual revision.

## **Complete if Known**

☐ Applicant claims small entity status. See 37 CFR 1.27

**TOTAL AMOUNT OF PAYMENT** (\$) 160.00

Application Number  
Filing Date  
First Named Inventor **Bloom**  
Examiner Name  
Art Unit  
Attorney Docket No. **1373US**

## **METHOD OF PAYMENT (check all that apply)**

☐ Check ☐ Credit card ☐ Money order ☐ Other ☐ None

☒ Deposit Account:

Deposit  
Account **07-1775**  
Number  
Deposit  
Account  
Name **Graco Inc.**

The Commissioner is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments  
☐ Charge any additional fee(s) during the pendency of this application  
☐ Charge fees(s) indicated below, except for the filing fee to the above-identified deposit account

## **FEE CALCULATION**

### **1. BASIC FILING FEE**

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	160.00

**SUBTOTAL (1)** (\$) 160.00

### **2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE**

Total Claims		Extra Claims		Fee from		Fee Paid	
				below			
				X			
				X			

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple independent claim, if not paid
1204	86	2204	43	**Reissue independent claims over original patent
1205	18	2205	9	**Reissue claims in excess of 20 and over original patent

**SUBTOTAL (2)** (\$)

\*\* or number previously paid, if greater; For Reissues, see above

## **FEE CALCULATION (continued)**

### **3. ADDITIONAL FEES**

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English Specification	
1812	2,520	1812	2,520	For filing a request or ex parte reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	745	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(k)	
1808	180	1808	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined 37 CFR 1.129(b)	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other Fee (Specify):

\*Reduced by Basic Filing Fee Paid

**SUBTOTAL (3)**

## **SUBMITTED BY**

Name (Print/Type) **Douglas B. Farrow** Registration No (Attorney/Agent) **28582** Telephone **612-623-6769**  
Signature *[Signature]* Date **March 26, 2004**

(Complete if applicable)

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Citizenship: All United States of America

Title of Invention: Air Spray Gun Improvements in  
Nozzle and Aircap

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Corporate Intellectual Property  
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Graco Minnesota Inc.  
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Minneapolis, MN 55440

**AIR SPRAY GUN IMPROVEMENTS IN NOZZLE AND AIRCAP**

**TECHNICAL FIELD**

This application claims the benefit of US Application serial number \_\_\_\_\_  
5 \_\_\_\_\_, filed \_\_\_\_\_.

**BACKGROUND ART**

Airspray guns (including HVLP and compliant variants) for spraying paints and  
coatings are well known tools for achieving a high quality finish.  
10

**DISCLOSURE OF THE INVENTION**

It is an object of this invention to provide such a spray gun which will yield  
improved spray results and which will be more consistently manufacturable to high  
standards.

15 The feeder passages in the aircap are slots which are significantly wider than the  
horn exit holes. This construction makes centerline offset much more forgiving by  
providing a consistent intersection of the passages. The feeder passages are also deeper in  
that they extent past the intersection point again making them more forgiving of  
irregularities.

Sealing and seating of the nozzle to the fluid inlet have also been improved over the prior art. Prior art designs allow the nozzle to float within the spray housing and seat firmly against the fluid inlet. In this prior art, attachment of the aircap to the spray housing did not adequately control concentricity of the two critical parts. In the instant invention, o-rings seal the nozzle to the fluid inlet and allow the shoulder of the nozzle to seat squarely on the spray housing controlling angularity.

These and other objects and advantages of the invention will appear more fully from the following description made in conjunction with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views.

#### **BRIEF DESCRIPTION OF DRAWINGS**

Figure 1 is a cross-section of the front end of the spray gun of the instant invention.

Figure 2 is a side view of the aircap of the prior art.

Figure 3 is a sectional view taken along line 3-3 of Figure 2.

Figure 4 is a side view of the aircap of the instant invention.

Figure 5 is a sectional view taken along line 5-5 of Figure 4.

Figure 6 is a side view of the aircap of the instant invention.

Figure 7 is a sectional view taken along line 7-7 of Figure 6.

**BEST MODE FOR CARRYING OUT THE INVENTION**

The front end 12 of an air spray gun 10 is shown in Figure 1. The general parts of the spray gun are the spray housing 14, a fluid inlet 16, a nozzle 18 and an aircap 20.

5           The feeder passages 22 in the aircap 20 are slots which are significantly wider than the horn exit holes. In the preferred embodiment, the slots 22 have a width of between two and three times the diameter or width of the horn exit holes 24. This construction makes centerline offset much more forgiving by providing a consistent intersection of the passages. The feeder passages 22 are also deeper in that they extent past the intersection  
10   point 26 again making them more forgiving of irregularities.

          Sealing and seating of the nozzle 18 to the fluid inlet 16 have also been improved over the prior art. Prior art designs allow the nozzle to float within the spray housing and seat firmly against the fluid inlet. In this prior art, attachment of the aircap to the spray housing did not adequately control concentricity of the two critical parts. In the instant  
15   invention, o-rings 28 seal the nozzle 18 to the fluid inlet 16 and allow the shoulder 18b of the nozzle 18 to seat squarely on the spray housing controlling angularity. Fine threads 18a and 16a on the nozzle 18 and fluid inlet 16 respectively provide further control of angularity and concentricity.

          It is contemplated that various changes and modifications may be made to the  
20   spray gun without departing from the spirit and scope of the invention as defined by the following claims.

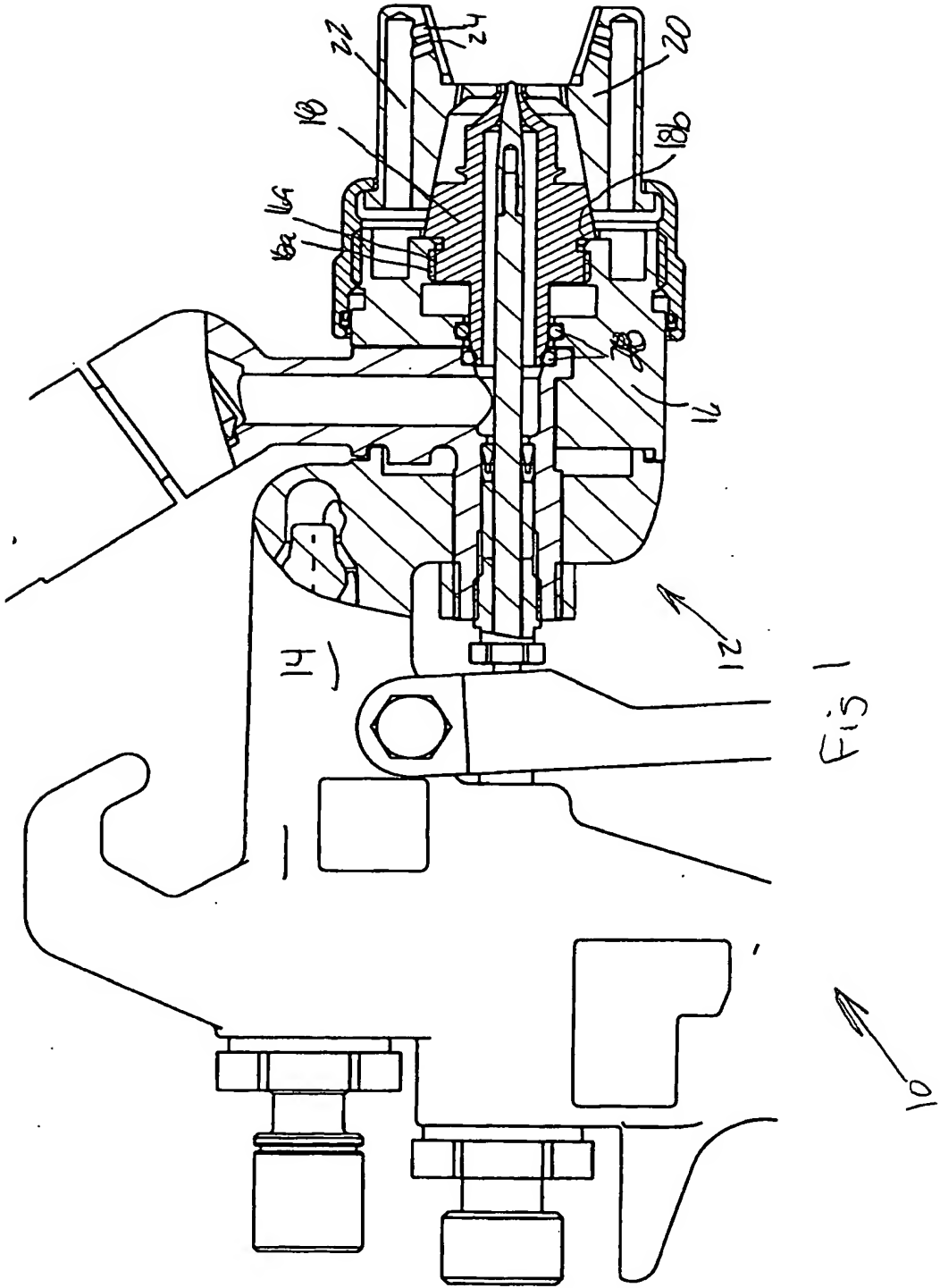


**CLAIMS**

1. In an aircap for an airspray gun having feeder passages which intersect with horn exit holes, said feeder passages and said horn exit holes each having widths, the improvement comprising said feeder passage widths being substantially greater than said horn exit hole widths.
2. The aircap of claim 1 wherein said feeder passage widths are at least twice as wide as said horn exit hole widths
3. In an aircap for an airspray gun having feeder passages which intersect with horn exit holes, said feeder passages having depths, the improvement comprising said feeder passage depths extending past the points of intersection with said horn exit holes.
4. In an air spray gun having a spray housing, a fluid inlet, a nozzle threaded into said fluid housing and an aircap, the improvement comprising a plurality of o-rings sealing said nozzle to said fluid inlet, said nozzle having a shoulder seating squarely on said spray housing to control angularity.

**ABSTRACT**

The feeder passages in the aircap of an air spray gun are slots which are significantly wider than the horn exit holes. This construction makes centerline offset much more forgiving by providing a consistent intersection of the passages. The feeder  
5 passages are also deeper in that they extent past the intersection point again making them more forgiving of irregularities. Sealing and seating of the nozzle to the fluid inlet have also been improved over the prior art. In the instant invention, o-rings seal the nozzle to the fluid inlet and allow the shoulder of the nozzle to seat squarely on the spray housing controlling angularity.



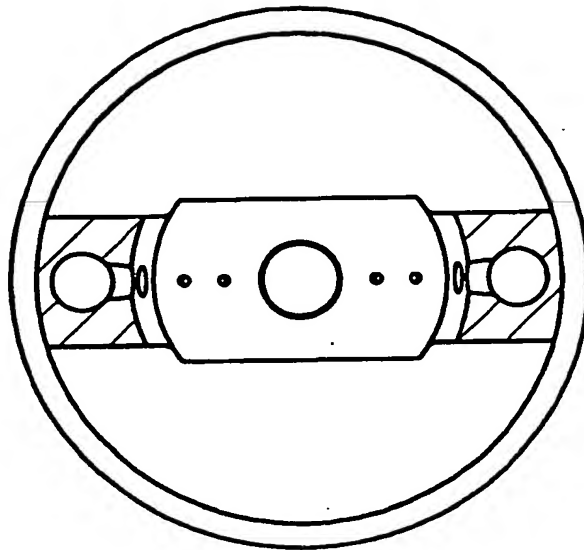


Fig 3  
PRIOR ART

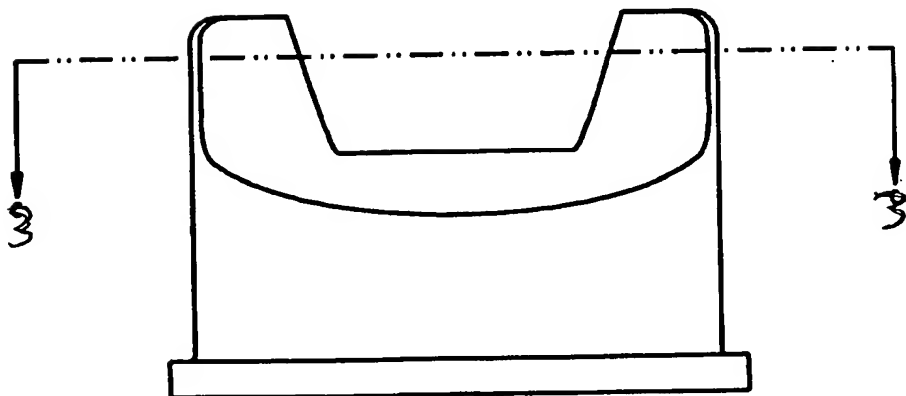


Fig 2  
PRIOR ART

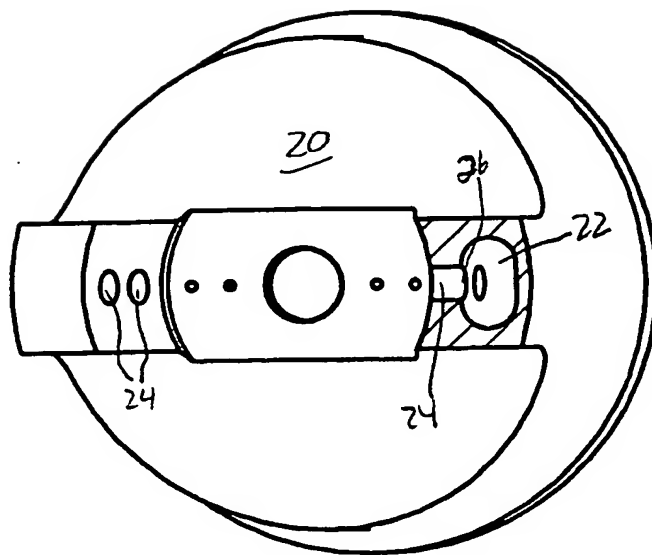


FIG 7

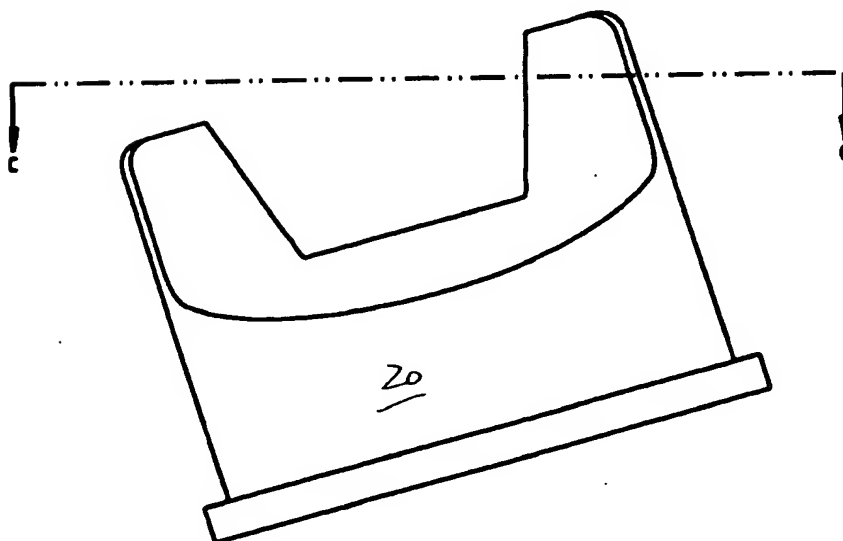


FIG 6

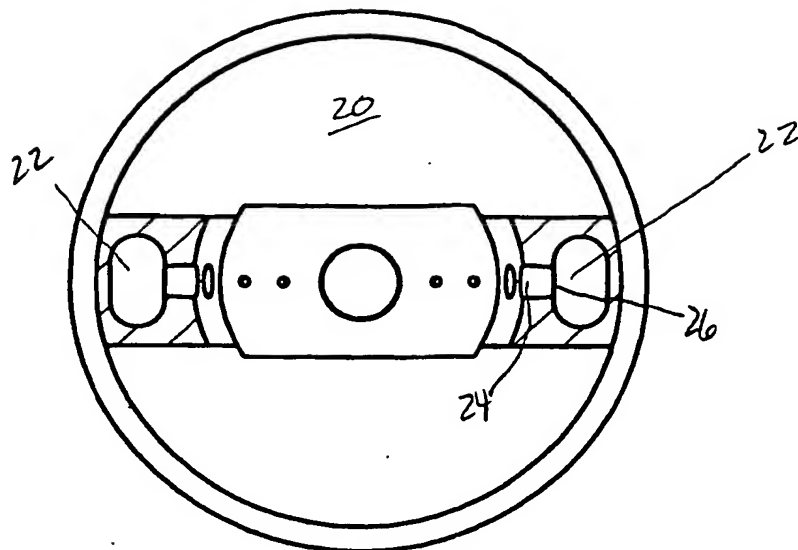


Fig 5

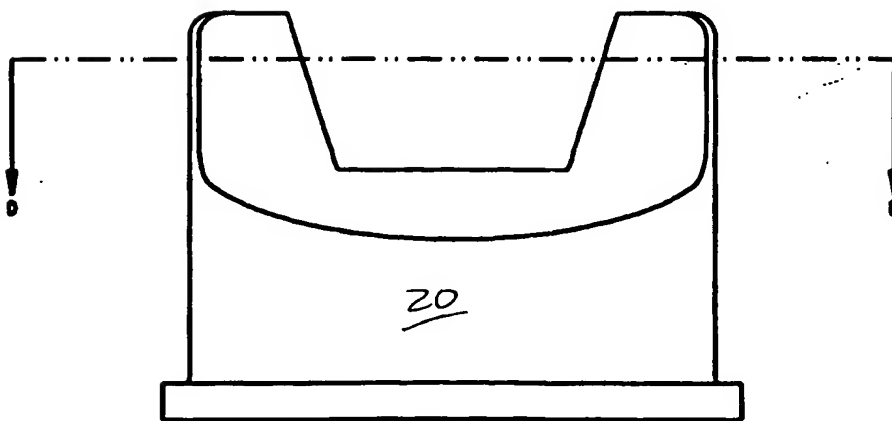


Fig 4